Medworth Energy from Waste
Combined Heat and Power Facility

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Environmental Statement Chapter 14 Climate Appendix 14A Consultation and Stakeholder engagement

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Appendix A
Consultation and Stakeholder engagement

A summary of the relevant responses received in the Environmental Impact Assessment (EIA) Scoping Opinion in relation to climate and confirmation of how these have been considered within the assessment to date is presented in **Table 14A.1 Summary of EIA Scoping Opinion responses for climate**.

Table 14.A.1 Summary of EIA Scoping Opinion responses for climate

Consultee	Issue raised	Response
The Planning Inspectorate (PINS)	The ES should include a description and assessment (where relevant) of the likely significant effects the Proposed Development has on Climate (for example having regard to the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change.	Both of these aspects of the EIA Regulations are covered in the Environmental Statement (ES) in **Section 14.9**
PINS	The Scoping Report explains that emissions associated with land use change are usually calculated on a national level. The Inspectorate agrees that impacts from the changes in land use type are not anticipated to result in significant effects and this matter can be scoped out of the assessment.	Changes in land use type have been scoped out of the greenhouse gas (GHG) emissions assessment of the climate chapter as indicated in **Table 14.17.**
PINS	The reprocessing of incinerator bottom ash (IBA) and other waste products into recycled materials would not take place at the Proposed Development. The Scoping Report therefore concludes that the GHG emission benefits from these activities would not be attributable to the Proposed Development. The Inspectorate is content that these benefits will not be assessed in the ES but welcomes that a discussion of recyclable products will be provided.	The Incinerator Bottom Ash (IBA) would be sent to a suitably licenced facility and in the UK where possible, for recycling, where metals contained within the IBA would be extracted and the remainder reclaimed for use as secondary aggregate. Emissions associated with transport of IBA for recycling are included in the ES (**Section 14.9**).
PINS	The ES should provide a description of the model used to determine the carbon footprint of the Proposed Development and the future baseline case.	The model is described in **Section 14.8**
PINS / Kings Lynn and West Norfolk Council (KLWN)	The ES should assess any likely significant effects on climate that could arise from the transportation of waste.	The combustion of fuel used in the transport of waste to the site and return transport movement from the site has been included in the GHG assessment, see **Section 14.6**.

Consultee	Issue raised	Response
PINS	The ES should explain the anticipated origin of waste fuel streams and describe any methods used to reduce the impacts from importation of such waste.	The origins of waste fuel have been identified in the Waste Fuel Availability Assessment submitted as part of the Development Consent Order (DCO) application. A range of expected waste compositions based on likely waste supply contracts are included in the ES as a sensitivity analysis of the calculation of GHG emissions **(Appendix 14C Sensitivity analysis (Volume 6.4)**).
Cambridgeshire County Council (CCC)	CCC state that the Proposed Development must be able to demonstrate net zero CO_2e by 2050 with credible plans to mitigate emissions and manage residual emissions through opportunities such as carbon capture and storage.	The Applicant has a corporate target to become carbon neutral by 2040 and carbon negative thereafter. This will include maintenance and reagents related measures. The Proposed Development is being designed in accordance with this target. The Proposed Development has been considered in relation to UK Government targets, see **Section 14.8** Furthermore, as described in **Chapter 3: Description of the Proposed Development (Volume 6.2)**, the Energy from Waste (EfW) Combined Heat and Power (CHP) Facility has been designed to allow the export of steam and electricity to surrounding business users via dedicated pipelines and private wire cables. Potential end users of the heat and power have been identified along the line of the disused March to Wisbech Railway, and discussions have been held with these users. Subject to agreement, by using the steam generated, users will be able to reduce their carbon footprint associated with steam and heat generation. This is considered in the sensitivity testing in **Appendix 14C Sensitivity analysis (Volume 6.4)** but has not been accounted for in the main GHG assessment, so agreement with users will increase the benefits stated.
CCC	The scoping report focusses on the diversion of residual waste from landfill. This is important. However, a greater level of consideration should be afforded to increased rates of recycling, reusing and circular economy principles which will reduce the supply of materials for burning, rather than	The waste composition and supply used in the model have been based on indicative types of residual waste available for the Proposed Development identified in the **Waste Fuel Availability Assessment (Volume 6.3)** submitted as part of the DCO application.

Consultee	Issue raised	Response
	assuming that all of the residual waste that is currently sent to landfill will continue at the same rate over the next 40 years. This approach is supported by the recently released Resources and Waste Strategy which aims to reduce waste and increase recycling within the timescales proposed.	This takes into account current targets for waste diverted from landfill, and for recycling, implicit in the information available on capacity requirements for relevant Waste Planning Authorities. The **Waste Fuel Availability Assessment (Volume 7.3)** which has informed the GHG assessment has taken into account relevant policy drivers from the recent Waste Management Plan for England[1] (also referred to as the Resources and Waste Strategy), including implementation of the waste hierarchy; the provision of the right waste infrastructure in the right place at the right time; and the need to reflect the 'proximity principle'. The ES includes a sensitivity analysis of waste composition and GHG emissions (**Appendix 14C Sensitivity analysis (Volume 6.4)**).
CCC	The EIA/ES should address whether there is a need for an Energy from Waste facility when other existing and developing technologies for reducing waste and generating energy more sustainably are accounted for and show that this demonstrated need outweighs any negative implications in terms of emissions (and the climate emergency) and identify how these implications will be addressed.	As a Nationally Significant Infrastructure Project (NSIP) the need for the facility is established at the national level. Notwithstanding this, the **Waste Fuel Availability Assessment (Volume 7.3)** and the Planning Statement submitted as part of the DCO application demonstrate the need for the Proposed Development at a regional level and how it is consistent with the waste hierarchy. A Project Benefits Report is also included with the DCO application.
CCC / Fenland District Council (FDC)	The EIA/ES should demonstrate the impact beyond the district boundaries.	The GHG assessment has no defined spatial boundary, as described in **Section 14.6** The Receptor (Earth's climate system) is global in nature, so there are no localised effects to consider. See **Section 14.6** for further details.
CCC / FDC	On consideration of distance waste will travel, considerations should be made to where waste will be imported as this will increase the carbon footprint of the project. The project will then need to demonstrate how it will off-set these imported emissions from the additional	The origins and transportation of waste fuel have been identified in the Waste Fuel Availability Assessment submitted as part of the DCO application. Embedded mitigation measures to reduce GHG emissions are

[1] DEFRA (2021). Waste Management Plan for England (January 2021).

Consultee	Issue raised	Response
	waste, if this is required to maintain operation of the Energy from Waste plant.	incorporated into the model, see **Sections 14.7** and **14.9.** The **Waste Fuel Availability Assessment (Volume 7.3)** also considers the potential for the facility to accept domestic residual material currently sent to EfW facilities in Europe, so reducing the export of waste from the UK and the associated travel distances. Providing local waste management assets also reduces carbon emissions from the transport of waste if the waste has to be exported elsewhere to be landfilled or treated.
CCC	In future proofing the facility in instances where the waste is no longer available to fuel this energy project in the surrounding area, consideration of alternative fuel sources should also be explained, alongside any additional environmental implications that may come from such alternatives.	The **Waste Fuel Availability Assessment (Volume 7.3)** submitted as part of the DCO application details the anticipated quantities of waste available to fuel this energy project in the future.
KLWN	KLWN Council anticipates recovery status will be brought up during the planning process; will the applicant be addressing this?	The Proposed Development will be compliant with R1 accreditation (as defined by the Environment Agency) which will be confirmed as part of the separate Environmental Permit process.

An overview of the key stakeholders consulted following scoping and a brief summary of the issues discussed in relation to climate is presented in **Table 14A.2 Summary of additional engagement regarding climate**.

Table 14A.2 Summary of additional engagement regarding climate

Consultee	Date and Form of engagement	Issue(s) raised	Response
CCC	11 December 2020, conference call – GHG Emissions	The transportation of IBA (and any others outside of the red line boundary of the Proposed Development) should be factored into the assessment.	The reprocessing of IBA and other waste products into recycled materials would not take place at the Proposed Development. As agreed with PINS at Scoping stage, effects are not assessed in the Climate assessment (see **Table 14A.1**). Emissions associated with the transport of IBA and Air Pollution Control residues

Consultee	Date and Form of engagement	Issue(s) raised	Response
			(APCr) are described and quantified in the ES (**Section 14.9**).
CCC	11 December 2020, conference call – GHG Emissions	CCC queried whether the assessment would take account of its emerging waste local and plan.	The emerging Waste Local Plan is now the adopted plan and has been considered when preparing the ES (see **Chapter 5: Legislation and Policy (Volume 6.2)**) and in the calculation of GHG emissions.
CCC	11 December 2020, conference call – GHG Emissions	CCC queried whether maintenance activities would be factored into the assessment. MVV provided an overview of the likely maintenance schedule. Arup, acting as technical advisors to CCC, considered that due to the scale of the maintenance activities it is likely that these can be scoped out of the assessment, in accordance with the <1% of total emissions approach. Arup agreed to consider this within their response to the technical note to be provided to CCC.	Emissions from maintenance activities have been included in the GHG assessment, equating to approximately 0.12ktCO_2e per year (**Section 14.9**).
CCC	11 December 2020, conference call – GHG Emissions	CCC sought clarity on the data sources proposed to identify methane emissions.	Data from the Department for Environment, Food and Rural Affairs (Defra) Review of Landfill Methane Emissions Modelling[57] has been utilised for the assessment (see **Section 14.8**).
CCC	11 December 2020, conference call – GHG Emissions	CCC queried how cumulative effects would be contextualised within the significance conclusions and advised that this would need to take account of the cumulative trajectory towards the net zero targets in line with the carbon budgets.	The GHG assessment examines the extent to which the Proposed Development has a likely significant effect on ability of the UK Government to meet its carbon target and budgets by 2050 to determine significance. The assessment considers the national projected GHG emissions, which take into account trends such as future development, technology and population changes. This enables the Proposed Development to be assessed in relation to the cumulative effect of decarbonisation, and the associated carbon budgets which apply to the whole UK economy.
KLWN	4 February 2021, written	Mitigation measures to reduce GHG emissions	**Section 14.7** includes mitigation measures embedded within the design to reduce

Consultee	Date and Form of engagement	Issue(s) raised	Response
	comments on the GHG Emissions methodology	should be stated within the ES.	GHG emissions. **Section 14.10** includes additional mitigation measures which have not been included in the GHG assessment but will increase the benefits stated. This includes the export of steam and electricity from the EfW CHP Facility to local businesses (see **Appendix 14C Sensitivity analysis (Volume 6.4)**).
KLWN	4 February 2021, written comments on the GHG Emissions methodology	Section 4.5.4 of the Technical Note states the stages that will be discounted as represent a very small/negligible amount of GHG emissions. This should be justified in more detail.	Further explanation has been included in **Section 14.8**.
KLWN	4 February 2021, written comments on the GHG Emissions methodology	Cumulative GHG emissions from nearby installations not associated with the development should be considered within the GHG methodology in the ES.	In line with the IEMA guidance[36] and as the scope for cumulative effects has the potential to be unlimited, it is not viable to assess cumulative effects resulting from the Proposed Development with the emissions of nearby installations. Further explanation has been included in **Section 14.8.** Furthermore, the Proposed Development has been designed to allow the export of steam and electricity from the EfW CHP Facility to surrounding business users via dedicated pipelines and private wire cables. This has not been accounted for in the GHG assessment on a precautionary basis, however agreement with users would increase the benefits stated. This is considered in the sensitivity testing in **Appendix 14C Sensitivity analysis (Volume 6.4)**.
KLWN	4 February 2021, written comments on the GHG Emissions methodology	More details need to be provided regarding the type of waste which will be used by the Proposed Development. Will the waste be taken straight from black bins (residual), or be sorted first before use? Further sorting of the waste at the development may improve the facility's energy efficiency and reduce GHG emissions. Additionally, if waste sorting does occur prior to incineration, where will this unused waste go?	The EfW CHP Facility provides an option for the management of residual waste, remaining after the removal of recyclables, which moves the management higher up the waste hierarchy than the alternative 'without Proposed Development' scenario where waste is sent to landfill.

Consultee	Date and Form of engagement	Issue(s) raised	Response
KLWN	4 February 2021, written comments on the GHG Emissions methodology	The GHG emissions associated with the transportation and end point of this waste need to also be quantified and included within the model.	The GHG emissions associated with the transport of waste have been included in the GHG model and estimated within the GHG assessment shown in **Section 14.9**.
KLWN	4 February 2021, written comments on the GHG Emissions methodology	The 'without Proposed Development' case only considers one waste future in which black bin waste will be taken to landfill if the Proposed Development is not built. KLWN believes this to be very limiting and potentially not a true reflection of how waste is disposed of in Norfolk as some already goes to Energy from Waste facilities.	The EfW CHP Facility provides an option for the management of residual waste, remaining after the removal of recyclables, which moves the management higher up the waste hierarchy than the alternative 'without Proposed Development' scenario where waste is sent to landfill. The **Waste Fuel Availability Assessment (Volume 7.3)** identifies that landfill disposal is the reasonable alternative for the management of residual waste proposed to be used at the EfW CHP Facility. The Waste Fuel Availability Assessment also identifies that some residual waste is incorporated in exports of Refuse Derived Fuel (RDF) to northern continental Europe (Netherlands and Germany) and Scandinavia (Sweden, Norway and Denmark), but highlights that RDF exports have been reducing due to recent tax changes[81] and the increase in the price of haulage making this disposal route a less financially viable option. Additionally, UK Government policy[22] is on applying the proximity principle (i.e. managing waste at a location as close as reasonably possible to where waste is generated). Therefore, the climate chapter considers a 'without Proposed Development' case where waste is collected and transported to available landfill sites.
KLWN and CCC	4 February 2021, written comments on the GHG Emissions methodology	Although it is stated the waste composition, origin, supply and anticipated quantities used in the GHG model will be based on the Waste Need Assessment [now called the Waste Fuel Availability Assessment], this document has not been supplied.	The **Waste Fuel Availability Assessment** (**Volume 7.3**) is submitted as part of the DCO application, and a draft was made available as part of statutory consultation.

Consultee	Date and Form of engagement	Issue(s) raised	Response
CCC	4 February 2021, written comments on the GHG Emissions methodology	The 'with Proposed Development' and 'without Proposed Development' approach and the context which the assessment will be made means there is no local baseline against which the Proposed Development can be made.	The GHG assessment has no defined spatial boundary, as described in **Section 14.6.** The Receptor (Earth's climate system) is global in nature, so there are no localised effects to consider. The approach adopted is to assess the change in emissions in the context of national emissions and national policy, in line with IEMA guidance[36]. This ES considers whether the change in emissions will prevent national government achieving national targets (i.e. carbon net zero by 2050 and the UK carbon budgets). The spatial boundary for the GHG assessment is the UK in terms of national emissions and national policy. The spatial boundary for regional/local GHG assessment is based on the spatial extent of the transportation of waste and contextualised against applicable policy relevant to the Proposed Development.
CCC	4 February 2021, written comments on the GHG Emissions methodology	With regard to contextualisation of emissions within the framing of national policy, the assessment methodology does not address the ability to deliver net zero emissions at the project level.	There is no national policy or regulatory requirement for projects to deliver net zero at a project level. The assessment therefore contextualises the emissions from the Proposed Development in the context of the UK target for net zero by 2050.
CCC	4 February 2021, written comments on the GHG Emissions methodology	CCC sought clarification on whether or not the GHG emissions model will provide more consideration of the supply and composition of residual waste.	The GHG emissions associated with waste have been included in the GHG model described in **Section 14.9** and estimated within the GHG assessment. The ES includes a sensitivity analysis of waste composition and GHG emissions (**Appendix 14C Sensitivity analysis (Volume 6.4)**).
CCC	4 February 2021, written comments on the GHG Emissions methodology	Declared it unlikely that the Waste Needs Assessment [now called the Waste Fuel Availability Assessment], has regard for the obligation placed on waste planning authorities to implement Articles of the Waste Framework Directive (2008/98/EC), specifically	Whilst the **Waste Fuel Availability Assessment** (**Volume 7.3**) is based on a spatial Study Area that extends beyond the administrative area of Cambridgeshire, the defined Study Area is considered to be a reasonable catchment area from which fuel for the facility could be sourced. Waste markets in the UK are directly influenced by a range of factors including waste type, availability of management capacity and government fiscal, waste management

Consultee	Date and Form of engagement	Issue(s) raised	Response
		Article 16 - Principles of proximity and self-sufficiency.	and planning policies. Whilst prevailing planning policy is that waste should be managed as close as possible to its point of arising, the complex range of influencing factors inevitably means there is a flow of material across the country (and beyond). This issue is considered in detail in the **Waste Fuel Availability Assessment** (**Volume 7.3**) and the Planning Statement (**Volume 7.1**). Furthermore, the **Waste Fuel Availability Assessment** (**Volume 7.3**) not only considers the extent to which the EfW CHP Facility would divert residual waste from landfill, but also the extent to which it diverts residual waste from exportation and treatment outside the UK's domestic boundaries. Specifically, the **Waste Fuel Availability Assessment (Volume 7.3)** draws on the findings of extant Waste Local Plans within the defined Study Area, and also looks forwards as to how waste might be managed if existing targets and aspirations relating to waste reduction, reuse and recycling are achieved, to consider how waste is likely to be managed in the future. Including national statutory obligations pursuant to the Waste Framework Directive as it has been incorporated into UK law.
CCC	4 February 2021, written comments on the GHG Emissions methodology	Some of the policy referenced in this section appears to address climate change adaption even though the Introduction to the Technical Note states vulnerability to climate change is not considered.	Comment noted. The Technical Note was intended to address the GHG assessment methodology only. The ES includes consideration of the vulnerability of the Proposed Development to climate change throughout, with the assessment presented in **Section 14.9**.
CCC	4 February 2021, written comments on the GHG Emissions methodology	CCC understand from the inception meeting that the catchment area for the origins of the waste fuel is fixed for the proposes of the GHG assessment. CCC note that any significant reduction in the availability of waste fuel within the original catchment area would lead to the expansion of the spatial scope and changed GHG emissions. This therefore produces a risk that GHG	The **Waste Fuel Availability Assessment (Volume 7.3**) submitted as part of the DCO application sets out a defined spatial scope, which forms the basis of assessment. However, waste markets in the UK are directly influenced by a range of factors including waste type, availability of management capacity and government fiscal, waste management and planning policies. Whilst prevailing planning policy is that waste should be managed as close as possible to its point of arising, the complex range of influencing factors inevitably means there is a flow of material across the

Consultee	Date and Form of engagement	Issue(s) raised	Response
		emissions associated with the sourcing of the waste fuel over the span of the temporal scope will be underestimated.	country (and beyond). In this context, it is important to recognise that the Proposed Development may draw in waste from beyond the spatial scope defined for the **Waste Fuel Availability Assessment Volume 7.3**). Notwithstanding this, the DCO submission demonstrates that there is a clear need for the proposed waste management capacity and to do this requires defining a Study Area for the need assessment. Whilst the **Waste Fuel Availability Assessment (Volume 7.3**) could look at the whole of England (or even the UK), it has been concluded that this would not represent the typical catchment area relevant to this facility and would not be a proportionate approach. Therefore, the assessment has focused on evaluating the requirement for additional capacity from within the broad geographic area that the EfW CHP Facility is likely to draw waste from as defined in the **Waste Fuel Availability Assessment** (**Volume 7.3**) submitted as part of the DCO application. The **Waste Fuel Availability Assessment** (**Volume 7.3**) is a tool to illustrate that, even within a restricted geographic catchment, the need for the waste management capacity offered by the proposed plant is evident. This assessment is not a means of identifying that the proposed facility should be tied to a specific catchment area. The assessment of GHG emissions from transport of waste, detailed in **Section 14.9**, reflects this assessment.
CCC	4 February 2021, written comments on the GHG Emissions methodology	CCC made the following comment regarding the temporal scope: There are resource efficiency measures set out in the Environment Bill 2020 that will impact the composition and quantity of residual waste available to the Proposed Development within the temporal scope of the assessment.	The GHG model in **Section 14.9** is based on a waste composition representative of design parameters for the Proposed Development at this stage. The 'firing capacity' specifications for the EfW CHP Facility allow for variation in waste composition within a range of input parameters and allows for the need to accommodate changes in waste composition by blending to homogenise the Net Calorific Value (NCV) of waste from a variety of sources.

Consultee	Date and Form of engagement	Issue(s) raised	Response
		The assessment needs to reflect the waste efficiency measures to be implemented within its temporal scope, be this by effectively continually extending the catchment area for waste fuel or 'devaluing' the carbon benefit associated with the Proposed Development. It is too simplistic to assume that fuel supply will undergo no changes within the temporal scope of the assessment.	The ES includes a sensitivity analysis of waste composition and GHG emissions (**Appendix 14C Sensitivity analysis (Volume 6.4)**).
CCC	4 February 2021, written comments on the GHG Emissions methodology	Baselines The replacement of a future baseline with a 'without Proposed Development' case that provides a 'landfill only' comparator for the purposes of GHG assessment does not acknowledge waste management reality in terms of management processes or spatial scope. It does not allow for a comparison of the GHG emissions associated with actual waste flows and current waste management practice without energy recovery and with energy recovery.	The EfW CHP Facility provides an option for the management of residual waste, remaining after the removal of recyclables, which moves the management higher up the waste hierarchy than the alternative 'without Proposed Development' scenario where waste is sent to landfill. The **Waste Fuel Availability Assessment** (**Volume 7.3**) identifies that landfill disposal is the reasonable alternative for the management of residual waste proposed to be used at the EfW CHP Facility. The Waste Fuel Availability Assessment also identifies that some residual waste is incorporated in exports of RDF to northern continental Europe (Netherlands and Germany) and Scandinavia (Sweden, Norway and Denmark), but highlights that RDF exports have been reducing due to recent tax changes[81] and the increase in the price of haulage making this disposal route a less financially viable option. Additionally, UK Government policy[22] is on applying the proximity principle (i.e. managing waste at a location as close as reasonably possible to where waste is generated). Therefore, the climate chapter considers a 'without Proposed Development' case where waste is collected and transported to available landfill sites. The availability of waste material based on current and future waste diversion from landfill requirements and capacities are based on the indicative types of residual waste available for the Proposed

Consultee	Date and Form of engagement	Issue(s) raised	Response
			Development identified in the Waste Fuel Availability Assessment. The **Waste Fuel Availability Assessment** (**Volume 7.3**) draws on the findings of the evidence bases of extant Waste Local Plans within a defined spatial Study Area. This includes a review of how these statutory Waste Planning Authorities have forecast future waste management requirements, based upon assumptions and realising targets associated with future waste reduction, reuse and recycling.
CCC	4 February 2021, written comments on the GHG Emissions methodology	Quantification of GHG emissions With regard to those parts of the infrastructure lifecycle to be included in the assessment further justification for discounting maintenance, repair, replacement, and refurbishment (B2 to B5) from the Use Stage (Stage B) is required. With a temporal scope of 40 years the GHG emissions from these activities cannot simply be said to be negligible. The Proposed Development will undergo regular maintenance and a number of its components will require replacement. The Proposed Development will consume various reagents and the supply of these reagents should be included in the Use stage assessment. It is noted that GHG emissions associated with the End of Life Stage (Stage C) will be based on the Before use Stage (Stage A), likely to principally focus on deconstruction and transport (C1 and C2). But some refinement, addressing waste recovery and disposal (C3 and C4) should be possible	Emissions from maintenance activities have been included in the GHG assessment, equating to approximately 0.12 kt CO_2e per year (**Section 14.9**).

Consultee	Date and Form of engagement	Issue(s) raised	Response
		based on current industry practice.	
CCC	4 February 2021, written comments on the GHG Emissions methodology	Assessment of significance The proposed approach 'dilutes' the impact by not applying a spatial scope contingent with CCC boundaries. This loads the assessment in favour of finding beneficial effect, as described in Paragraph 4.6.6 i.e. "the extent to which the increase/decrease in GHG emissions has a material effect on the ability of the UK Government to achieve its net zero target."	The spatial scope of the GHG assessment is stated in **Section 14.6**. The GHG assessment has no defined spatial boundary, as described in **Section 14.6.** The Receptor (Earth's climate system) is global in nature, so there are no localised effects to consider. The approach adopted is to assess the change in emissions in the context of national emissions and national policy; will this change in emissions prevent national government achieving national targets (i.e. carbon net zero by 2050). This assessment is complemented by an assessment of the change in emissions in the context of regional/local emissions and regional/local policies where applicable. The spatial boundary is the UK in terms of national emissions and national policy. The spatial boundary for regional/local assessment is based on the spatial extent of the applicable policy.
CCC	4 February 2021, written comments on the GHG Emissions methodology	Magnitude **Table 4.2** states that if GHG emissions between the 'with Proposed Development' and 'without Proposed Development' case are approximately neutral then the impact is 'negligible' with no implication for carbon targets i.e. does not materially affect the ability of UK Government to meet its net zero target. The logic is flawed. The comparator used in the 'without Proposed Development' case is landfill which will emit methane into the atmosphere past 2050, so how can the Proposed Development - with a similar emissions profile - be considered net zero if the base case is not net zero? Improving on emissions from the base case alone is not	The calculation of emissions from landfill in the 'without Proposed Development' scenario detailed in **Section 14.6**, is based on the lifetime emissions to enable direct comparison with emissions from waste incinerated. The carbon emissions associated with incinerating one tonne of waste occur at the moment the waste is incinerated. The carbon (methane) emissions associated with one tonne of waste landfilled will take place over several years; these emissions are rolled up and assumed to occur at the moment the waste is landfilled. There is no requirement for the project to be net zero in isolation; it needs to be compatible within the UK net zero target. The point previously made in **Table 14A.1** as referred to in this consultation response was that if the magnitude between 'with Proposed Development' and 'without Proposed Development' is negligible then the Proposed Development is having no impact (either positive or negative) on the UK Government's ability to meet the net

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		necessarily enough to create beneficial effects – it may be an improvement but still not align with net zero. The grading of magnitude set out in **Table 4.2** has, perhaps, been chosen to give the impression that the assessment is more nuanced than is the case.	zero target relative to the 'without Proposed Development' case. This is not the same as saying that the Proposed Development is be net zero.
CCC	4 February 2021, written comments on the GHG Emissions methodology	Paragraph 1.1.3 - "The Proposed Development will also have the capability to export steam and electricity to users on the surrounding industrial estate." This sentence is not as definitive as the preceding sentence which states electricity will be exported to the grid and suggests plant may only be CHP enabled. The use of heat is critical to process efficiency and R1 categorisation and in mitigating GHG emission impacts. (Please confirm if the assessment will be based on CHP operation or electricity generation only.)	It is intended that surplus electricity will be exported to the national grid, but the Proposed Development will also have the ability to supply electricity and heat to local industrial customers. The GHG assessment shown in **Section 14.9** has been carried out on the precautionary assumption that all surplus electricity is exported to the grid.
CCC	4 February 2021, written comments on the GHG Emissions methodology	Paragraph 2.1.11 – Avoided fossil fuels – GHG benefit from avoided fossil fuel power generation. Please confirm the model to be used in the GHG assessment will identify the source and profile of the fuel mix used to establish benefit.	To determine the avoided emissions (lifecycle stage D) it has been assumed that the Proposed Development will displace electricity at the UK grid average for all fuels. Energy statistics produced by BEIS and published in DUKES 2021[76] have been used to calculate GHG emissions associated to the avoided emissions. This is presented in **Section 14.9.** Additional sensitivity analysis has considered future decarbonisation of electricity generation for the UK grid, which uses BEIS forecasts for UK Grid average emissions factors to calculate GHG emissions associated with the avoided

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			emissions[56] (**Appendix 14C Sensitivity analysis (Volume 6.4)**).
CCC	4 February 2021, written comments on the GHG Emissions methodology	Paragraph 2.1.12 – The GHG assessment will consider the transport of waste to landfill, GHG emissions from landfill and any emissions from marginal power generation. Please confirm estimation of GHG emissions from landfill will take into account resource efficiency measures set out in the Environment Bill 2020 i.e. 10% limit on disposal to landfill for Local Authority Collected Waste by 2035. Corresponding assumptions should be made in relation to power generation.	The 'without Proposed Development' case accounts for waste landfilled, recycled and recovered. The availability of waste material based on current and future waste diversion from landfill requirements and capacities are based on the indicative types of residual waste available for the Proposed Development identified in the Waste Fuel Availability Assessment. The ES includes a sensitivity analysis of waste composition and GHG emissions (**Appendix 14C Sensitivity analysis (Volume 6.4)**).
CCC	4 February 2021, written comments on the GHG Emissions methodology	Paragraph 3.2.2 – Although not yet part of UK policy, the UK Government announced a new ambitious target to reduce the UK's emissions by at least 68% by 2030 compared to 1990 levels, in December 2020. Acknowledging that the information published in December 2020 is advisory only will the Developer 'update' the approach taking into consideration the advice in relation to both energy and waste?	The ES chapter is based on legislated policy available at the time of production. Any emerging policies and guidance are considered in the assessment. **Section 14.3** details relevant policy and guidance.
CCC	4 February 2021, written comments on the GHG Emissions methodology	Paragraph 4.3.1 – The assessment therefore examines the difference between the 'with Proposed Development' case and the 'without Proposed Development' case. Please expand the paragraph to describe what difference	A description of the 'without Proposed Development' case is presented in **Section 14.5.** The magnitude of the effect is dependent on the extent to which the net difference (increase/decrease) in GHG emissions between the 'with Proposed Development' and 'without Proposed Development' cases, has a material effect on the ability

Consultee	Date and Form of engagement	Issue(s) raised	Response
		between the cases will be assessed.	of the UK Government to achieve its net zero target.
CCC	4 February 2021, written comments on the GHG Emissions methodology	Paragraph 4.3.4 – The projected operational life of the Proposed Development is 40 years. Please confirm if the 40-year period includes the construction phase. If not please state, the duration of the construction phase and confirm it is included in the temporal scope of the assessment.	The construction phase of the Proposed Development is expected to be three years (between 2023 – 2026). For the purpose of the assessment, a working assumption has been made that the Proposed Development has an operation lifespan of approximately 40 years. However, it should be noted that it is common for such developments to be operational for longer periods. For the purposes of the GHG assessment it has been assumed that the Proposed Development will be operational for 40 years (2026 – 2066). The temporal scope of the GHG assessment detailed in **Section 14.6** includes the period over which the Proposed Development would be in construction, operation, and decommissioning.
CCC	4 February 2021, written comments on the GHG Emissions methodology	Paragraph 4.3.6 - Estimations of any changes to the waste mix throughout the operational phase will also be considered. Please confirm by 'mix' you are referring to changes in the composition of the waste fuel. Please confirm if consideration will take account of changes in general waste types making up the waste fuel and/or changes to the make-up (waste fractions) of each general waste type. Please outline how changes affecting the calorific value of the waste fuel will be addressed in the assessment.	The GHG model in **Section 14.9** is based on a waste composition representative of design parameters for the Proposed Development at this stage. The 'firing capacity' specifications for the EfW CHP Facility allows for variation in waste composition within a range of input parameters and allows for the need to accommodate changes in waste composition by blending to homogenise the NCV of waste from a variety of sources. The ES includes a sensitivity analysis of waste composition and GHG emissions (**Appendix 14C Sensitivity analysis (Volume 6.4)**).
CCC	4 February 2021, written comments on the GHG	Paragraph 4.3.9 – The clearing of the site in its current form is considered	As detailed in **Table 14.17**, GHG emissions from site clearance activities are likely to be negligible and not significant. Clearance will include existing buildings,

Consultee	Date and Form of engagement	Issue(s) raised	Response
	Emissions methodology	within 'before use' stage of the life cycle assessment. Please confirm that the assessment will account for the GHG emissions arising from site clearance.	the removal of some soil and associated earthworks. PINS has confirmed that impacts from the changes in land use type are not anticipated to result in significant effects and this matter can be scoped out of the assessment.
CCC	4 February 2021, written comments on the GHG Emissions methodology	Paragraph 4.4.2 – Quantification: The output of this process is a projection of net increase or decrease in GHG emissions as a result of the Proposed Development. Please confirm that net increase or decrease in GHG emissions is measured against GHG emissions associated with the landfilling of a comparable quantity of waste to that to be processed by the Proposed Development. Please confirm that this comparable quantity of waste is not related to the level of landfill activity carried out within the area of the Waste Planning Authority.	The GHG assessment in **Section 14.9** details net changes in GHG emissions associated with a 'without Proposed Development' scenario in which a comparable quantity of waste to that to be processed by the Proposed Development is sent to landfill over the same time period. The methodology accounts for waste from local authorities and businesses in a Study Area defined in the **Waste Fuel Availability Assessment (Volume 7.3**), which would be landfilled in the 'without Proposed Development' case. The **Waste Fuel Availability Assessment** (**Volume 7.3**) considers areas wider than just Cambridgeshire.
CCC	4 February 2021, written comments on the GHG Emissions methodology	Paragraph 4.6.1 – Contextualisation: The scale of the quantified emissions is considered within the framing of the relevant national, sectoral and/or local policy pertaining to climate change. In relation to contextualisation the Developer may wish to consider establishing the 'significance' of the two cases together. This might provide a better indication of net zero achievability rather than just comparing the difference in GHG emissions.	The determination of significance in **Section 14.9** is based on the net increase or decrease of GHG emission between the 'with Proposed Development' and 'without Proposed Development' cases.
CCC	4 February 2021, written comments on the GHG	Paragraph 4.6.1 – Therefore, the assessment methodology aims to determine the relative scale of the impact of the	Local issues, objectives, targets and plans for reducing GHG emissions have also been qualitatively considered in the ES chapter. Therefore, the extent to which the

Consultee	Date and Form of engagement	Issue(s) raised	Response
	Emissions methodology	Proposed Development on global climate change by considering the sensitivity (or value) of the receptor, its impacts and the magnitude of that impact on relevant carbon budgets and targets at a national and local level. It is our understanding that assessment is in the context of national carbon budgets only. Please confirm that the assessment will consider the impact on local level carbon targets in 2030 and 2050.	Proposed Development affects the ability of CCC to meet its own net zero 2050 vision is taken into account. However, the assessment of significance is contextualised against UK carbon budgets only, and local targets are therefore not the basis of assessment.
CCC	4 February 2021, written comments on the GHG Emissions methodology	Paragraph 4.6.6 – The magnitude of the effect is dependent on the extent to which the increase/decrease in GHG emissions has a material effect on the ability of the UK Government to achieve its net zero target. Please define 'material'. This term seems subjective. Magnitude needs to be quantifiable.	In line with IEMA guidance[36], a good practice approach has been adopted to determine significance based on the contextualisation of GHG emissions from the Proposed Development relative to national targets. This assessment is complemented by an assessment of the change in emissions in the context of regional/local emissions and regional/local policies where applicable. The GHG assessment does not provide a quantifiable definition of magnitude, however this is in line with IEMA guidance[36].
CCC	4 February 2021, written comments on the GHG Emissions methodology	The assessment approach is about the contribution of the Proposed Scheme to delivery of national carbon budgets and not about establishing the net zero credentials of the Proposed Development as a stand-alone project.	Agreed that the approach that has been taken for the GHG assessment is about contextualising the Proposed Development in line with national carbon targets. There is no policy requirement for the Proposed Development to be net zero at a project level and this is therefore not used in the GHG assessment.

A summary of the relevant responses received to the Preliminary Environmental Information Report (PEIR) and confirmation of how these have been considered within the assessment is presented in **Table 14A.3 Summary of PEIR responses for climate together with subsequent engagement**.

Table 14A.3 Summary of PEIR responses for climate together with subsequent engagement

Consultee	Issue raised	Response
CCC	For the 'without Proposed Development' the average travel distance used to determine transport related GHG emissions is 48.9km, which it is stated is derived from Department for Transport (DfT) freight data (DfT (2020). TSGB0430 (RFS0105): Goods lifted and moved by commodity and length of haul). However, there is no explanation as to how the distance of 48.9km has been derived from the referenced dataset.	The PEIR used the average distance of 48.9km travelled by heavy goods vehicles (HGV) to a landfill obtained from the Department for Transport (DfT) dataset on domestic road freight transport by commodity and length of haul[66], which includes statistics on waste. Travel distances for landfill have been updated for the ES GHG assessment in **Section 14.6** to 46.9km based on the 2021 DfT data. This has been calculated as the average distance for a haul length up to 150 km (approximately the two-hour catchment) by dividing the goods moved (million tonne km) data by the goods lifted (million tonne) data for waste related products. It is assumed that in the 'without Proposed Development' scenario, residual waste would be transported to a local landfill site.
	As a Nationally Significant Infrastructure Project there is sense to determining 'significance' by contextualising the scheme's emissions with reference to national budgets. But at the same time, the 'with development' and 'without development' approach (and the context in which the assessment will be made) means there is no local baseline against which the Proposed Development can be compared. The assessment approach seeks to 'hide' local impact by placing the emissions in the context of national carbon reduction targets on the basis that the impact of local carbon emissions arising from the Proposed Development can be addressed through the achievement of national targets. The chosen approach ensures that the emissions from the 'with Proposed Development' case appear beneficial compared to emissions from the 'without Proposed Development' case i.e. landfill.	The GHG assessment has no defined spatial boundary, as described in **Section 14.6**. The Receptor (Earth's climate system) is global in nature, so there are no localised effects to consider. The assessment approach adopted in **Section 14.9** is to assess the change in emissions in the context of national emissions and national policy: whether the change in GHG emissions will prevent national government achieving national targets (i.e. carbon net zero by 2050). This assessment is complemented by an assessment of the change in emissions in the context of regional/local emissions and regional/local policies where applicable. The GHG assessment indicates a net reduction in emissions in the 'with Proposed Development' scenario compared to a 'without Proposed Development' scenario (see **Section 14.9**).
	Table 14.1 includes a list of consultee comments and developer responses in relation to the Scoping Opinion. In response to the comment by Cambridgeshire County Council that "*a greater level of consideration should be afforded to increased rates of recycling, reusing and circular economy principles which will reduce the supply of materials for burning, rather than assuming*	The ES includes a sensitivity analysis of waste composition and GHG emissions (**Appendix 14C Sensitivity analysis (Volume 6.4)**).

Consultee	Issue raised	Response
	that all of the residual waste that is currently sent to landfill will continue at the same rate over the next 40 years." The developer states that "*The Draft Waste Fuel Availability Assessment has taken into account relevant policy drivers from the recent Waste Management Plan for England (also referred to as the Resources and Waste Strategy)*". Whilst the statement is factually correct the response does not address the comment, which relates to foreseeable policy drivers set out in the Environment Bill 2020. The policy drivers referred to in the response all relate to policy that is potentially supportive of the Proposed Development.	
	Table 14.2 includes a list of consultee comments and developer responses in relation to additional engagement regarding climate. Kings Lynn & West Norfolk (KLWN) Council asked for more details in relation to waste types and sorting. The developer's response states: "*The Draft Waste Fuel Availability Assessment made available as part of statutory consultation provides details of waste sorting methods and waste destination and outlines the specific types of waste that the facility would target*." From our reading of the dWFAA it is not clear that details of sorting methods and destinations (post-sorting) are provided.	Response to original comment in **Table 14A.2** amended: The EfW CHP Facility provides an option for the management of residual waste, remaining after the removal of recyclables, which moves the management higher up the waste hierarchy than the alternative 'without Proposed Development' scenario where waste is sent to landfill.
	KLWN Council also commented that "*The 'without Proposed Development' case only considers one waste future in which black bin waste will be taken to landfill if the Proposed Development is not built. KLWN believes this to be very limiting and potentially not a true reflection of how waste is disposed of in Norfolk as some already goes to Energy from Waste facilities*." The developer's response states: "*The Draft Waste Fuel Availability Assessment made available as part of statutory consultation identifies the most likely alternative destination for waste in reviewing the availability of waste for use as fuel. This information has been used for the GHG emissions assessment. The identification is based on achieving existing targets and reductions relating to waste reduction, reuse and*	Response to original comment in **Table 14A.2** amended: The EfW CHP Facility provides an option for the management of residual waste, remaining after the removal of recyclables, which moves the management higher up the waste hierarchy than the alternative 'without Proposed Development' scenario where waste is sent to landfill. The **Waste Fuel Availability Assessment** (**Volume 7.3**) prepared for submission identifies that landfill disposal is the reasonable alternative for the management of residual waste proposed to be used at the EfW CHP Facility. The **Waste Fuel Availability Assessment** (**Volume 7.3**) also identifies that some residual waste is incorporated in exports of RDF to northern continental Europe (Netherlands and Germany) and Scandinavia (Sweden, Norway and Denmark), but highlights that

Consultee	Issue raised	Response
	recycling, along with a review of how statutory Waste Planning Authorities have forecast future waste management requirements, based upon assumptions and realising targets associated with future waste reduction, reuse and recycling." From our reading of the dWFAA it takes no account of existing targets and reductions relating to waste reduction, reuse and recycling as it simply assumes that all residual waste currently landfilled would continue to be landfilled in the 'without Proposed Development' case.	RDF exports have been reducing due to recent tax changes[81] and the increase in the price of haulage making this disposal route a less financially viable option. Additionally, UK Government policy[22] is on applying the proximity principle (i.e. managing waste at a location as close as reasonably possible to where waste is generated). Therefore, the climate chapter considers a 'without Proposed Development' case where waste is collected and transported to available landfill sites.
	The Committee on Climate Change in setting out the sixth Carbon Budget specifically states with regard to the waste sector: "*Reductions in residual waste sent to energy-from-waste, achieved as above via increased recycling rates and reductions in waste arisings (including food waste), but also including changes in waste tonnages sent to landfill or exported. Waste reductions and recycling/AD/composting need to out-pace the bans on landfilling and export of wastes to avoid increased residual waste volumes being sent to EfW facilities*." DfT have also recently published (July 2021) the Transport Decarbonisation Plan, making commitments to delivering a zero emissions freight and logistics sector. **Table 14.3** in particular should be updated to reflect the latest position of the Committee on Climate Change (and DfT) on decarbonisation of the waste sector.	The EfW CHP Facility provides an option for the management of residual waste, remaining after the removal of recyclables. The ES includes a sensitivity analysis of waste composition and GHG emissions (**Appendix 14C Sensitivity analysis (Volume 6.4)**). The DfT's Transport Decarbonisation Plan[45] is considered with **Table 14.8** Government emissions factors from the Emissions Factors Toolkit[54] are used in this assessment to account for reducing emissions in the future.
	The study area used in the determination of GHG emissions should be coterminous with the borders of the former East of England planning region (subject to comments elsewhere in this Technical Note relating to waste logistics data) and these emissions should then be used for contextualisation.	The spatial scope of the GHG assessment is set out in **Section 14.6**. The assessment approach adopted in **Section 14.9** is to assess the change in emissions in the context of national emissions and national policy: whether the change in GHG emissions will prevent national government achieving national targets (i.e. carbon net zero by 2050). This assessment is complemented by an assessment of the change in emissions in the context of regional/local emissions and regional/local policies where applicable.
	Given the temporal scope of the assessment it should reflect the transport efficiency improvements in relation to large	Government emissions factors from the Defra Emissions Factors Toolkit[54] (Version

Consultee	Issue raised	Response
	goods vehicles that are likely to occur over the next few decades. A potential source of information is the DfT webtag.	11) are used in this assessment to account for reducing emissions in the future.
	Table 14.8 and the reference to BEIS carbon factors to be updated to reflect the latest 2021 dataset.	Emissions factors in the PEIR are based on BEIS greenhouse gas reporting: conversion factors 2020. The ES includes an updated assessment which considers 2021 updates to BEIS GHG reporting factors.
	The replacement of a future baseline with a 'without Proposed Development' case that provides a 'landfill only' comparator for the purposes of GHG assessment does not acknowledge waste management reality in terms of management processes or spatial scope. It does not allow for a comparison of the GHG emissions associated with actual waste flows and current waste management practice without energy recovery and with energy recovery. The described comparator approach is simplistic and does not account for foreseeable future changes in the quantities and types of waste emulating from policy drivers and actions already undertaken.	The GHG assessment is in line with IEMA guidelines[36] considering each stage of the development (construction, operation and decommissioning) and comparison with a reasonable alternative (in this case landfill). The Waste Fuel Availability Assessment submitted as part of the DCO application identifies the most likely alternative destination for waste in reviewing the availability of waste for use as fuel.
	Furthermore, the comparator approach assumes the same quantity and composition of waste will be either incinerated or landfilled for the duration of the operational phase. It also assumes that the national energy mix remains unaltered throughout the operational phase and that the energy produced from incinerating waste will always displace an equivalent quantity of fossil fuel. The described comparator approach is simplistic and does not account for foreseeable future changes in the national energy mix emulating from policy drivers and actions already undertaken.	The ES includes a sensitivity analysis of waste composition and decarbonisation of energy supplies (**Appendix 14C Sensitivity analysis (Volume 6.4)**).
	Scope of Assessment – For the avoidance of doubt the introduction to this section should make it clear the scope includes the full life cycle of the Proposed Development as described in Section 14.8.	The PEIR highlighted that it was not possible to include all aspects for a full life cycle GHG inventory analysis, and further detail would be presented in the ES. **Table 14.17** sets out the life cycle stages considered.
	We understand that the recovery of Incinerator Bottom Ash (IBA) will take place	The reprocessing of IBA and other waste products into recycled materials would not

Consultee	Issue raised	Response
	off-site and, therefore, the carbon emissions associated with the recovery process are out of scope. The reference to IBA sales to market should therefore be clarified with regard to the type of emissions, related to this activity, that are included in the scope of the assessment.	take place at the Proposed Development. As agreed with PINS at Scoping, effects are not assessed in the Climate assessment (see **Table 14A.1**). Emissions associated with transport of IBA and APCr are included in the ES (**Section 14.9**.
	The spatial scope of the assessment is, effectively, national as opposed to the quantification of emissions which is governed by the study area described in the dWFAA. The benefit and disbenefit to host authority with regard to its own carbon reduction targets is therefore not considered by the assessment; or rather the assessment assumes that a positive contribution to national carbon reduction targets also represents a positive contribution to local targets. The assessment should clearly demonstrate how the contribution to national carbon reduction targets impacts on local carbon reduction targets, taking into consideration that the current local carbon budget does not include an energy recovery facility at Wisbech. For example, would the Proposed Development, if built, impact on target dates set out in local carbon reduction plans.	The GHG assessment has no defined spatial boundary, as described in **Section 14.6**. The Receptor (Earth's climate system) is global in nature, so there are no localised effects to consider. The assessment approach adopted in **Section 14.9** is to assess the change in emissions in the context of national emissions and national policy: whether the change in GHG emissions will prevent national government achieving national targets (i.e. carbon net zero by 2050). This assessment is complemented by an assessment of the change in emissions in the context of regional/local emissions and regional/local policies where applicable.
	It is agreed that all GHG '*emissions to the global climate receptor are considered direct, negative and permanent…*' but determining significance is nuanced and based on three items: 1. Difference in GHG emissions between baseline and proposed scheme (just because a scheme is an improvement on baseline does not necessarily mean it is a positive significance); 2. How the proposed scheme responds to local and national plans; and 3. Benchmarks and contextualisation with carbon budgets.	The assessment approach adopted in **Section 14.9** is to assess the change in emissions in the context of national emissions and national policy: whether the change in GHG emissions in the 'with Proposed Development' scenario in comparison to the 'without Proposed Development' scenario will prevent national government achieving national targets (i.e. carbon net zero by 2050). This assessment is complemented by an assessment of the change in emissions in the context of regional/local emissions and regional/local policies where applicable. The GHG assessment is in line with IEMA guidelines[36] considering each stage of the development (construction, operation and decommissioning) and comparison with a reasonable alternative (in this case landfill).
	The description of the future baseline scenario in the 'Likely significant effects' column of **Table 14.10** should be expanded to make it clear that waste 'sent to landfill' is	The **Waste Fuel Availability Assessment (Volume 7.3)** submitted as part of the DCO application identifies the most likely alternative destination for residual waste in

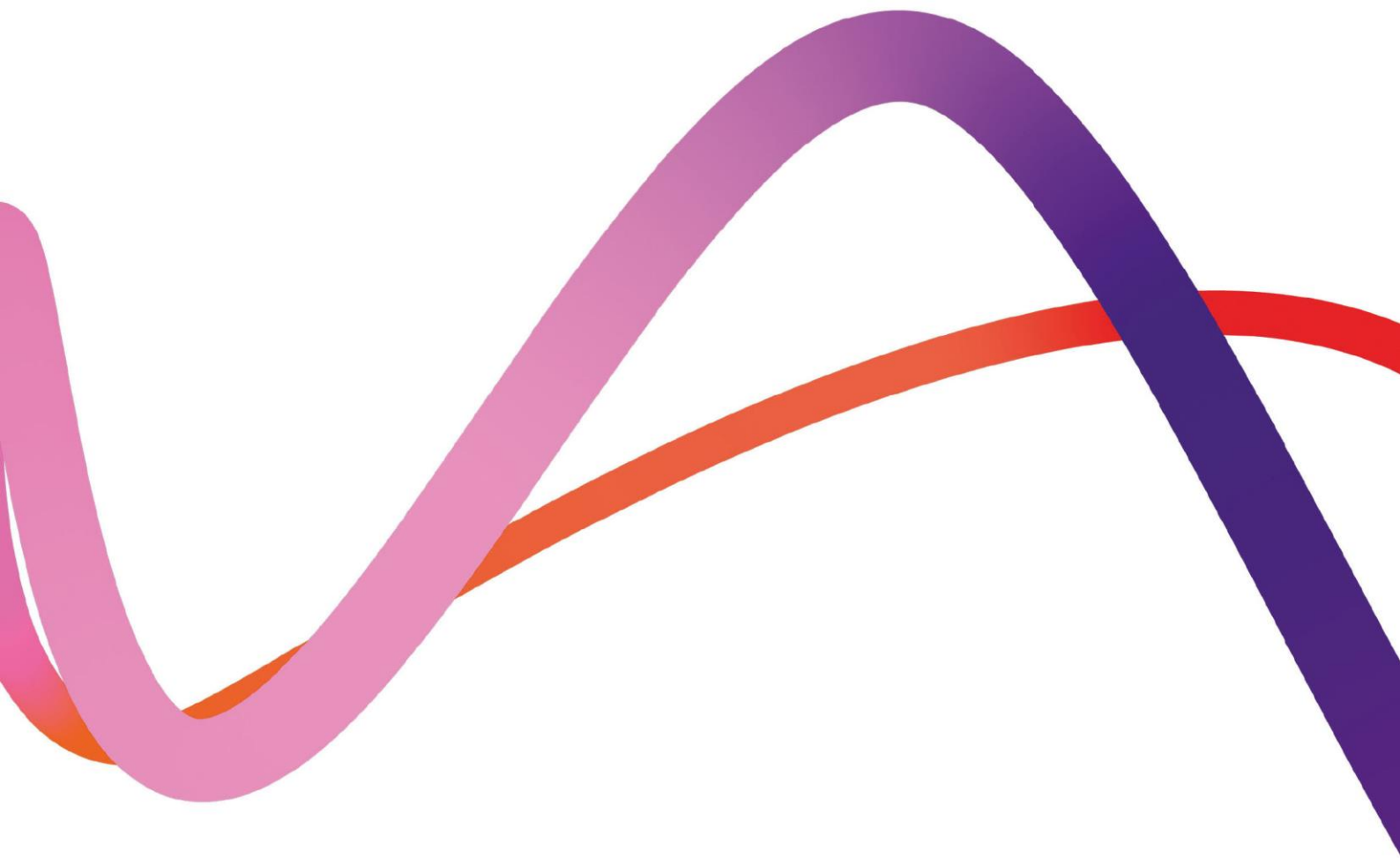
Consultee	Issue raised	Response
	not a continuation of the status quo but takes account of policy drivers that will reduce the use of landfill over the temporal scope of the assessment.	reviewing the availability of waste for use as fuel. This information has been used for the GHG emissions assessment.
	Table 14.14 presents the UK wide Committee on Climate Change carbon budgets. Any scheme will appear insignificant in comparison to UK wide emissions. Inclusion of specific carbon trajectories for the waste sector and possibly the materials and construction sector from the Committee on Climate Change's sixth Carbon Budget should be considered.	The assessment described in **Section 14.9** is based on assessing whether the Proposed Development would impede the UK in being carbon net zero by 2050 (with the Climate Change Committee stating that sector emissions from waste reduced from today's levels by 75% by 2050[44]), this being the UK position in terms of meeting international obligations to reduce carbon emissions.
	Table 14.16 addresses the life cycle stages of the 'without Proposed Development' This includes references to recycling facilities yet earlier descriptions of the 'without Proposed Development' only refer to landfill. Clarify the basis for determining GHG emissions under the 'without Proposed Development' case and ensure an accurate description of what constitutes 'with Proposed Development' is used at the first appropriate point.	Reference to recycling facilities in the 'without Proposed Development' scenario has been removed. The GHG assessment considers the management of residual waste after the removal of recyclables.
	Table 14.17 states that if GHG emissions between the 'with Proposed Development' and 'without Proposed Development' case is approximately the same then the impact is 'negligible' with no implication for carbon targets i.e., does not materially affect the ability of UK Government to meet its net zero target. The logic is flawed. The comparator used in the 'without development' case is landfill which will emit methane into the atmosphere past 2050, so how can the Proposed Development - with a similar emissions profile - be considered net zero if the base case is not net zero? Improving on emissions from the base case alone is not necessarily enough to create beneficial effects – it may be an improvement but still not align with net zero.	The approach that has been taken for the GHG assessment is about contextualising the Proposed Development in line with national carbon targets. There is no policy requirement for the Proposed Development to be net zero at a project level and this is therefore not used in the GHG assessment.
	The table also refers to materiality but what constitutes 'material' in relation to significance criteria is not set out. Whilst accepting quantification of the concept is not possible some type of qualitative evaluation should be possible, and this should be described within the sub-section.	The magnitude of the impact of the Proposed Development has been evaluated based on the extent to which the Proposed Development materially affects the ability of the UK Government to meet its carbon target and budgets. The GHG assessment does not provide a quantifiable definition of magnitude, however this is in line with IEMA

Consultee	Issue raised	Response
	The basis for determining materiality in relation to the significance criteria should be set out in the sub-section.	guidance[36]. The scale of the GHG emissions from all sources in the 'with Proposed Development' case has been contextualised within their overall impact on the UK Government's UK carbon target of 'net zero' in 2050 and the UK carbon budgets.
	The grading of magnitude set out in **Table 14.17** has, perhaps, been chosen to give the impression that the assessment is more nuanced than is the case. The table should be amended to the following significance parameters: 'Adverse', 'Negligible', 'Beneficial'.	**Table 14.19** of the ES considers adverse, negligible and beneficial significance scenarios. The grading has been updated to reflect the latest IEMA guidance[36] which includes one level of beneficial significance.
	Whilst the use of normalisation factors in relation to embodied carbon emissions is understood some sensitivity analysis around the choice of normalisation factor and how this affects the estimate of construction related emissions would be useful e.g., per MW versus per tonne.	This comment is no longer relevant to the assessment as updates have been made to the methodology for embodied carbon. Benchmarking using other developments and normalisation factors is not part of the assessment.
	In relation to construction vehicle emissions the assessment should include both tail pipe emissions and the emissions associated with the production/refining of diesel fuel, both sets of emission factors are reported in BEIS. The Environmental Statement submitted as part of the DCO application should use the factor updates found in BEIS 2021.	Emissions factors for traffic have been sourced from the Defra Emissions Factors Toolkit V11[54] Only direct emissions from tailpipes are considered in this assessment, in accordance with standard practice. Well to wheel emissions are not typically considered in assessments of this nature and would to some extent balance each other out when considered in both the 'with Proposed Development' and 'without Proposed Development' scenarios, so these are not considered within the assessment.
	Whilst it is accepted that waste composition data is a general representation of the HIC waste identified in the dWFAA and that the Environmental Statement will include more relevant waste composition data based on likely fuel supply contracts and changes in composition it should be noted that local data indicates that segregated waste collections significantly reduce the percentage of organic waste in the residual waste stream, perhaps by half or more compared to the percentage given in **Table 14.22.** A lower than assumed organic content will potentially change the NCV of the waste fuel in the 'with Proposed Development' case but will also reduce the methane generation	Further sensitivity assessment of carbon emissions is included in the ES at **Appendix 14C Sensitivity analysis (Volume 6.4)**, including consideration of potential changes to waste composition in terms of targets to reduce food, plastics and other recyclables in residual waste.

Consultee	Issue raised	Response
	potential of landfilled waste in the 'without Proposed development' case. Sensitivity analysis in relation to the effect of changing waste composition on GHG emissions should take account of local findings.	
	It has not been possible to replicate all of the values given in **Table 14.23** in our own calculations using the information and assumptions set out in the chapter. A more detailed description of the calculations or supporting worksheet should be included in the Environmental Statement.	A full list of assumptions made in the GHG assessment are appended to the ES (**Appendix 14B Assumptions and limitations (Volume 6.4)**).
	In relation to avoided emissions we concur with the comments of the CCC Energy Manager, Sarah Wilkinson, particularly in relation to the assumptions used regarding the displacement of fossil fuels. The quantification of avoided emissions shall reflect the proportion of fossil fuel (gas) currently used to produce electricity and the CCC's Balanced Net Zero Pathway assumptions regarding future changes in the electricity generation mix and grid carbon intensity.	Further sensitivity assessment of carbon emissions associated with the Proposed Development is included in the ES at **Appendix 14C Sensitivity analysis (Volume 6.4)**, this includes consideration of emissions factors for the overall UK grid and future decarbonisation of the electricity supplies
	Whilst gross and net GHG emissions from the Proposed Development have been calculated their contextualisation against UK carbon budgets masks the fact that the Proposed Development will be a carbon emitter. There is no reference to any consideration of additional mitigation to minimise these emissions, such as carbon capture and use systems (CCUS).	It is acknowledged that as a standalone entity the Proposed Development results in net carbon emissions when considering emissions from the EfW combustion processes compared to avoided emissions for energy generated by the EfW CHP Facility. However, the GHG assessment in **Section 14.9** indicates a net reduction in emissions in the 'with Proposed Development' scenario compared to a 'without Proposed Development' scenario. The Proposed Development includes land set aside for the possible future inclusion of carbon capture and storage (CCS) technology, subject to technical viability and developing government policy.
KLWN	Incinerator bottom ash (IBA) and other waste product reprocessing has been scoped out of the GHG emissions impact assessment, on the basis that the reprocessing is not carried out at the proposed facility site. No assessment of the	The reprocessing of IBA and other waste products into recycled materials would not take place at the Proposed Development. As agreed with PINS at Scoping stage, effects are not assessed in the Climate assessment (see **Table 14A.1**).

Consultee	Issue raised	Response
	transportation of IBA and other waste products is highlighted. It is not clear whether the reprocessing of the IBA and other products includes these extra transportation journeys. Further clarification on this should be provided, along with an explanation on whether these extra journeys are scoped into the GHG emissions impact assessment or not.	Emissions associated with transport of IBA and APCr are included in the ES (**Section 14.9**).
	Overall, on page 93, paragraph 14.10.1 the proposed development is considered to have a high (beneficial) significant effect in terms of GHG emissions. However, earlier in the document on page 76, paragraph 14.9.46 the proposed development is assessed as having a 'low (beneficial) significant impact'. This needs to be clarified as to whether the significant impact is 'high (beneficial)' or 'low (beneficial)' and amended for ES where this can then be reviewed further.	The GHG assessment within the ES concludes that the Proposed Development will have a beneficial significant effect. The grading of significance has been updated to reflect the latest IEMA guidance[36] which includes one level of beneficial significance
	The impact of additional HGV traffic movements during construction and operational will need to be further considered and a traffic assessment included in the final ES, along with a travel plan. Once this traffic assessment has been completed then chapter 14 needs to be amended in line with any additional traffic movements.	Emissions associated with construction and operational transport are based on traffic data provided in **Chapter 6: Traffic and Transport (Volume 6.2)**.
Wisbech Town Council	With regards to climate change, further explanation is required on what constitutes a 'reasonable worst-case scenario'. It is not accepted that the future baseline scenario where waste continues to be sent to landfill is reasonable. There are other baseline scenarios which could be considered, such as alternative thermal treatment technologies or other site closer to the source of residual waste.	The EfW CHP Facility provides an option for the management of residual waste, remaining after the removal of recyclables, which moves the management higher up the waste hierarchy than the alternative 'without Proposed Development' scenario where waste is sent to landfill. The **Waste Fuel Availability Assessment** (**Volume 7.3**) identifies that landfill disposal is the reasonable alternative for the management of residual waste proposed to be used at the EfW CHP Facility. The **Waste Fuel Availability Assessment** (**Volume 7.3**) also identifies that some residual waste is incorporated in exports of RDF to northern continental Europe (Netherlands and Germany) and Scandinavia (Sweden, Norway and Denmark), but highlights that RDF exports have been reducing due to recent tax changes[81] and the increase in the price of haulage making this disposal route a less financially viable option. Additionally, UK Government policy[22] is on applying the

Consultee	Issue raised	Response
		proximity principle (i.e. managing waste at a location as close as reasonably possible to where waste is generated). Therefore, the climate chapter considers a 'without Proposed Development' case where waste is collected and transported to available landfill sites.
	It is not clear how emissions from traffic generated by the proposal have been considered. It is understood that incinerator bottom ash (IBA) would be transported to a suitably licensed facility in the UK where possible (see paragraph 3.7.40 of the PIER). This suggests that it is possible that IBA may be exported out of the country if there is no capacity at licensed facilities in the UK. Notwithstanding this, the scope of the climate change assessment does not include the transport of IBA to a licensed facility.	The IBA would be sent to a suitably licenced facility and in the UK where possible, for recycling, where metals contained within the IBA would be extracted and the remainder reclaimed for use as secondary aggregate. Emissions associated with transport of IBA for recycling are included in the ES (**Section 14.9**).
	Further information is required on the assumptions used to calculate the avoided emissions i.e. the GHG emissions that would otherwise be generated by the UK electrical power network generating an equivalent amount of electricity.	A full list of assumptions made in the GHG assessment are appended to the ES (**Appendix 14AB Assumptions and limitations (Volume 6.4)**).



Medworth Energy from Waste
Combined Heat and Power Facility

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Environmental Statement Chapter 14 Climate Appendix 14B Assumptions and limitations

Regulation reference: The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 Regulation 5(2)(a)

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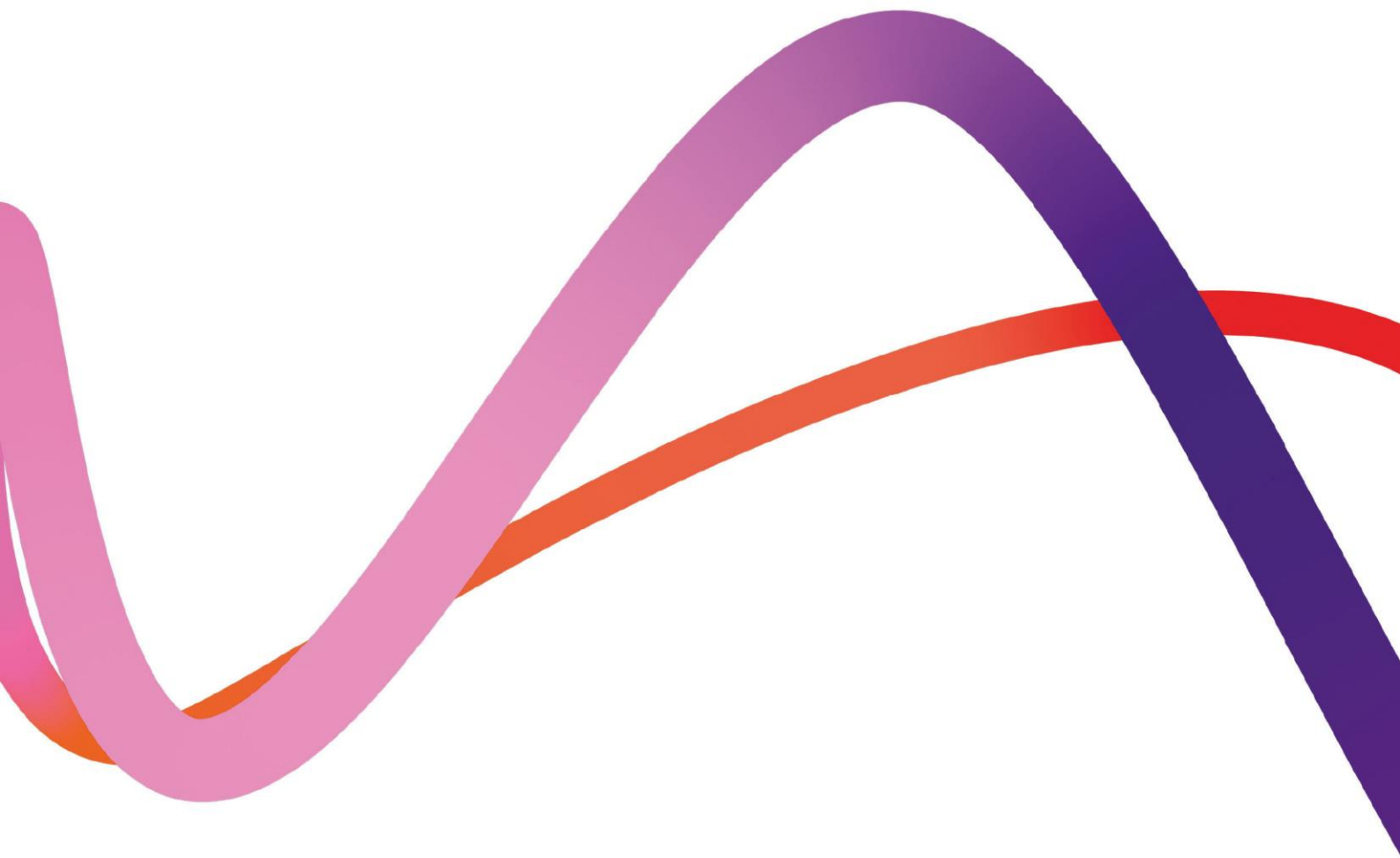
Appendix 14B
Assumptions and limitations

Item	Assumption
Assessment methodology[89]	The greenhouse gas (GHG) assessment methodology for stack emissions is based on the Carbon Assessment carried out by the Carbon Trust for the Cory Riverside Energy from Waste (EfW) Facility, comparing emissions from the combustion of residual waste as a fuel source in the EfW Facility, with the alternative scenario of landfill disposal with electricity generation from the collection of landfill gas (LFG).
Waste composition[60,61,62]	Waste to be used as fuel for the EfW Combined Heat and Power (CHP) Facility is assumed to be the residual portion of industrial, commercial and household MSW after recycling. The composition of residual waste used in the assessment is based on Waste and Resources Action Programme (WRAP)'s national survey of municipal waste for England in 2017 and information in the WRATE GHG calculator for MSW (provided by the Applicant), identifying the typical carbon content (biogenic and fossil carbon) and calorific values of different waste streams, returning a representative NCV of 9.53 MJ/kg. The following is assumed for MSW biogenic carbon, non-biogenic (fossil) carbon and Net Calorific Value (NCV) values used in the assessment: - The separate WRAP categories for 'Recyclable Paper' and 'Card' are assumed to be equivalent to the WRATE category for 'Paper and Card' - The WRAP categories for 'Other Organic' and 'Wood' wastes are assumed to be equivalent to the WRATE category for 'Garden Organics' - The WRAP category for 'Other Waste' is assumed to be equivalent to the WRATE category for 'Misc Non-Combustibles'. - Assumed no carbon content or NCV for metals
EfW, facility design	The Proposed Development is based on receiving up to 625,600 tonnes of residual (non-recyclable) waste per annum. The net electricity generation for the EfW CHP Facility, operating in electricity only mode is 55MWe (allowing for 5MWe parasitic load). The EfW CHP Facility is designed to maintain a constant fuel thermal input capacity, so the quantity of waste inputs may be adjusted according to the calorific value of the material. i.e. less waste may be required for material with a higher calorific value and vice versa.
Equivalent emissions factors for stationary combustion processes[63.64]	The GHG assessment includes an estimate of N_2O and CH_4 emissions associated with Stationary Combustion Processes, based on Intergovernmental Panel on Climate Change (IPCC) Guidelines for Greenhouse Gas Inventories and factors for Global Warming Potential (GWP): - N_2O default emissions factor for Stationary Combustion, municipal wastes (non-biomass fraction) = 4kgN_2O/TJ - N_2O to CO_2 GWP = 265kgCO_2e/kg N_2O - CH_4 default emissions factor for Stationary Combustion, municipal wastes (non-biomass fraction) = 30kgCH_4/TJ - CH_4 to CO_2 GWP = 28kgCO_2e/kg CH_4

Item	Assumption
EfW facility auxiliary burners[71]	The GHG assessment includes an estimate of GHG emissions for the use of fuel in auxiliary burners during the start-up and shut-down of the EfW CHP Facility. It is assumed that: - The EfW CHP Facility would use 1,939,360 litres per annum of gas oil (diesel), 90% of which would be used for the auxiliary burners and the remaining 10% would be used for maintenance, repair, replacement and refurbishment activities. If Hydrotreated Vegetable Oil (HVO) is used, emissions from fuel use would be reduced. - The fuel emissions factor for gas oil is based on Department for Business, Energy and Industrial Strategy (BEIS) GHG reporting conversion factors 2021.
Landfill gas emissions[57]	The estimate of GHG emissions associated with landfill disposal of residual waste and electricity generation from LFG is based on the following factors referenced in a Department for Environment, Food and Rural Affairs (Defra) report on landfill methane emissions modelling based on a UK scenario: - The percentage of biogenic carbon which is converted to LFG is 50% - The ratio of methane to carbon dioxide in UK LFG is calculated to be 57:43% rather than the generally assumed 50:50% - The quantum of methane that is flared from operational sites with LFG utilisation is estimated to be 1/11th of the methane utilised in gas engines. (i.e. 9.1%) - Net electrical efficiency assumption of 36% (including losses for parasitic load) - The collection efficiency for a subset of modern, large landfill operations in the UK is 68% (data from 2011) - Landfill Methane Oxidation. It is recommended that until further measurements are made at UK landfill sites, the IPCC default value for methane oxidation of 10% is retained.
Offsetting of electricity generation from landfill gas and from the EfW CHP Facility[71,65,76]	The GHG assessment includes an estimate of GHG emissions offset by electricity generated by the EfW CHP Facility and from the use of LFG in gas engines at landfill sites. It is assumed that: - for landfill the calorific value of methane is 50MJ/kg - electricity generated from the capture of LFG and by the EfW Facility would displace the use of UK Grid average electricity generation with an equivalent CO_2 emissions factor of 182g/kWh.
Embodied carbon of construction materials	Based on assumptions from the WRAP, Net Waste Tool (2008)[73,] wastage rates used to assess the amount of waste based on material quantities, and the Waste Benchmark Calculator data from query submitted on BRE Smartwaste[72] 21/03/2019, this calculates the estimated material resource required for the project over the construction period. The calculation uses a 15,000 m^2 estimate of the gross internal area (GIA) of the Proposed Development and categorises this as civil engineering under BRE Smartwaste's defined component categories. Material quantities for concrete and metals are based upon information available from the Applicant from similar facilities. Using the total materials required for the Proposed Development (inclusive of waste) and the Inventory of Carbon and Energy (ICE) Database[74] carbon factors / BEIS 2021 emission factors[71] the embodied carbon GHG emissions over the construction phase is determined.

Item	Assumption
Construction process emissions	Construction process emissions (including on-site energy and water use, and waste generated) have been calculated using Royal Institution of Chartered Surveyors (RICS)'[75] construction KPI for process emissions of 1,400 kgCO_2e per £100,000 construction cost.
Road traffic emissions	Traffic flows have been provided by the project transport consultants. Distances travelled have been calculated based on the expected origin of residual waste identified in the **Waste Fuel Availability Assessment (Volume 7.3)**. Emissions have been calculated using the Defra Emissions Factors Toolkit[54].
Maintenance emissions during operation	Calculated using the BEIS 2021 emissions conversion factor[71] for gas oil. Assumes an operational lifetime for the Proposed Development of 40 years. If HVO is used, emissions from fuel use would be reduced.
Operational water use emissions	Calculated using the BEIS 2021 emissions conversion factor[71] for water supply. Assumes an operational lifetime for the Proposed Development of 40 years.
Emissions associated with the recycling / disposal of IBA and APCr	The Incinerator Bottom Ash (IBA) remaining after combustion equates to approximately 26.5% by weight of the input waste and will be sent to a suitable recycling facility. For IBA, emissions are based upon BEIS 2021 emissions conversion factor[71] for the recycling of commercial and industrial waste. No closed-loop recycling factor is provided by BEIS for commercial and industrial waste, so the open-loop factor has been used. The Air Pollution Control (APCr) residues amount to approximately 5% of the total waste by volume and will be sent to a suitable facility for disposal. For APCr, emissions are based upon BEIS 2021 emissions conversion factor for the landfill of aggregates (APCr are not dissimilar to powdered cement). Assumes an operational lifetime for the Proposed Development of 40 years.
Operational energy use of landfills	Based upon knowledge of annual energy consumption at closed landfill sites (considered to be representative of the 'without Proposed Development' scenario). Uses the grid emissions factor from BEIS Fuel Mix Disclosure Data[65] of 182 g CO_2e / kwh.
Use of qualitative climate change data	Regional UK Climate Projections 2018 (UKCP18) data[59] (12 km) is available which better represents local effects and therefore wind and snowfall data can be extracted. However, for the purposes of this assessment, qualitative literature has been utilised, due to the uncertainties mentioned in **Section 14.4.** The regional model is driven at its boundaries by the GC3.05 global model, which allows for greater spatial detail. However, GC3.05 only samples the warmer end of the range of global outcomes. This means that the set of regional simulations will not cover the full range of outcomes simulated by the 28 global climate projections for the Representative Concentration Pathway (RCP) 8.5 scenario, adding uncertainty. Therefore, for the purposes of this assessment, the qualitative narrative is sufficient to inform of the future baseline used in the assessment.



Medworth Energy from Waste
Combined Heat and Power Facility

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Appendix C
Sensitivity Analysis

1.1 Variables considered

1.1.1 In determining likely carbon emissions associated with the 'With Proposed Development' and 'Without Proposed Development' cases, the greenhouse (GHG) assessment has been based on reasonable and conservative assumptions for current conditions. However, there is potential for variation in some of the parameters used in the GHG assessment, both under current conditions and in the future. The following are identified as some of the key parameters with potential for variation used in the GHG assessment, which are evaluated further in the sensitivity analysis:

- Waste composition;
- Electricity generation emissions factors; and
- Combined Heat and Power (CHP): Export of steam (in addition to electricity).

Waste composition

1.1.2 As described previously in **Section 14.8 Assessment methodology,** the waste composition used for the main GHG assessment (Core Case) has been based on residual waste composition available from Waste and Resources Action Programme (WRAP)'s national survey of municipal waste for England in 2017 (published in 2020)[60] which is considered to be representative of waste that would currently be available for the Energy from Waste (EfW) Combined Heat and Power (CHP) Facility. Given UK Government policy to achieve a recycling rate of 65% for municipal solid waste by 2035[1] and an emphasis on preventing the generation of food and plastic waste, the sensitivity analysis considers two alternative scenarios for future waste composition. There is some debate as to whether the targets for recycling will be met, however the first alternative considers a scenario where current household recycling rates (45.5% in 2019[2]) are increased by 20% to achieve a 65% target for recycling. The second alternative considers a 'best-case' scenario where there is a significant reduction in food and plastics entering residual waste, although recognising that it may not be possible to eliminate all this material from residual waste. The three cases considered for residual waste composition in the sensitivity analysis are:

- ***Current residual waste (Core Case)*:** based on WRAP 2017 residual waste composition, assuming this accounts for a recycling rate of 45%.[60]
- ***Reduced Recyclables***: assuming a further 20% reduction in recyclable materials (paper, card, plastics, glass, metals, food, garden, wood and textiles) in the WRAP 2017 residual waste composition.[60]

[1] HM Government (2018). England's National Waste Strategy. Our Waste, Our Resources, a Strategy for England.
[2] UK Statistics on Waste, DEFRA (July 2021).

- ***Reduced Food and Plastics****:* assuming a 90% reduction in food and plastic in the WRAP 2017 residual waste composition, along with a 20% reduction in other recyclable materials (as for the *Reduced Recyclables* scenario). [60]

1.1.3 The **Waste Fuel Availability Assessment** (**Volume 7.3**) has considered forecasts for future waste availability, which takes into account UK Government targets for recycling, and established that demand for managing residual waste would still exceed the design capacity of the proposed EfW CHP Facility. For the purposes of the sensitivity analysis, it is therefore assumed that the design quantity for residual waste managed by the EfW CHP Facility would remain constant (i.e., up to 625,600 tonnes/yr), and the reduction in recyclable materials under future waste scenarios would be balanced by an increase in other types of waste material.

Electricity generation emissions factors

1.1.4 The GHG assessment assumes that electricity generated by both the EfW CHP Facility ('with Proposed Development') and from utilisation of landfill gas (LFG) ('without Proposed Development'), would avoid emissions from electricity generation supplied by the UK Grid. For the Core Case it has been assumed that avoided emissions are representative of current average UK Grid electricity generation from all sources, using an estimated emissions factor of 182tCO_2/GWh[65]. The sensitivity analysis considers three other scenarios for electricity generation emissions factors, taking into account plans for future decarbonisation of electricity generation and also the existing generation of electricity from fossil fuels. In line with guidance from the Department for Environment, Food and Rural Affairs (Defra)[3] on a reasonable substitute for energy generated by EfW plants, the first case considers electricity generation from gas-fired power stations (CCGT) as the source of electricity generation that would be avoided. Recognising the move towards long term decarbonisation of energy supplies and goals to achieve Net Zero by 2050, the other two scenarios consider projections for the reduction in carbon emissions for UK Grid average electricity generation, based on forecast emissions factors for 2035 and 2050. The four cases considered for electricity generation emissions factors in the sensitivity analysis are:

- ***Current CCGT:*** current emissions factor for electricity generation from natural gas = 380tCO_2/GWh.[65]
- ***Current UK Grid Average (Core Case)*****:** current emissions factor for average UK Grid electricity generation = 182tCO_2/GWh.[65]
- ***2035 UK Grid Average*****:** forecast emissions factor for average UK Grid electricity generation in 2035 = 23tCO_2/GWh.[56]
- ***2050 UK Grid Average*****:** forecast emissions factor for average UK Grid electricity generation in 2050 = 6tCO_2/GWh.[56]

CHP: Export of steam

1.1.5 In addition to generating electricity the proposed EfW CHP Facility has been designed to allow the export of steam to surrounding business. This has not been accounted for in the Core Case for the GHG assessment on a precautionary basis;

[3] DEFRA (2014). Energy from waste. A guide to the debate.

however, the export of steam would provide further benefits in displacing the use of fuels by third parties to generate heat and avoid carbon emissions from these sources. Based on information provided by the Applicant, a design case considered for the combined export of electricity and steam assumes that the EfW CHP Facility would have the capacity to export 48.8MWe of electricity (allowing for 5MWe parasitic load) and 23.6MWth of steam. With respect to emissions avoided from the supply of steam, it is assumed that this would replace the use of natural gas as fuel for heating, with an associated emissions factor of 202.97g/kWh[56]. This is considered reasonable for current conditions and through to 2035; however, in the scenario presented for 2050 the sensitivity analysis has considered the case where the use of electricity for heating is more widespread and assumes a forecast emissions factor for average UK Grid electricity generation in 2050 of 6tCO_2/GWh[56] (although depending on requirements technologies such as air and ground source heat pumps may not provide sufficient heat to meet the demand, and in the long term hydrogen may replace the use of natural gas as a fuel used for heating). The two cases considered for the EfW CHP Facility energy export options in the sensitivity analysis are:

- ***Electricity Only (Core Case):*** 55MWe of electricity.
- ***Electricity and Heat:*** 48.8MWe of electricity and 23.6MWth of steam.

1.2 Sensitivity analysis results

1.2.1 The sensitivity analysis uses the same methodology for determining GHG emissions outlined in **Section 14.8 Assessment Methodology**, allowing for variation in the parameter values discussed above for each of the sensitivity variables.

1.2.2 The waste composition breakdown for the three waste cases is presented in **Table 14C.1 Residual waste composition – current and future scenarios**, along with the associated carbon content and Net Calorific Value (NCV) for the respective wastes used in the calculation of GHG emissions for the sensitivity analysis. Summary results for the sensitivity analysis are presented in **Table 14C.2 Comparative sensitivity analysis of net annual emissions savings**, reporting the estimated net savings in annual GHG emissions from operation of the proposed EfW CHP Facility, compared to utilisation of LFG. The net savings in annual GHG emissions for the Core Case presented in the main GHG assessment is identified in the highlighted cell in **Table 14C.2 Comparative sensitivity analysis of net annual emissions savings.**

Table 14C.1 Residual waste composition – current and future scenarios

Waste Stream	Current (Core Case)	Reduced Recyclables	Reduced Food & Plastic
Recyclable Paper	5.9%	5.5%	8.5%
Card	6.3%	5.9%	9.1%
Non-recyclable Paper	8.9%	10.4%	16.0%

Waste Stream	Current (Core Case)	Reduced Recyclables	Reduced Food & Plastic
Dense Plastic	7.8%	7.3%	1.4%
Plastic film	8.2%	7.7%	1.5%
Textiles	5.5%	5.1%	7.9%
Misc. Combustible	9.3%	10.9%	16.7%
Misc. Non-Combustible	3.6%	4.2%	6.5%
Other Wastes	0.3%	0.4%	0.5%
Glass	2.6%	2.4%	3.7%
Ferrous Metals	2.4%	2.2%	3.5%
Non-Ferrous Metals	1.1%	1.0%	1.6%
Food Waste	27.0%	25.2%	4.9%
Garden Waste	2.7%	2.5%	3.9%
Other Organic	2.3%	2.7%	4.1%
Wood	2.3%	2.1%	3.3%
WEEE	1.1%	1.3%	2.0%
Hazardous	0.5%	0.6%	0.9%
Fines	2.2%	2.6%	4.0%
Net Calorific Value (MJ/kg)	9.53	9.50	8.85
Total waste input (tonnes/yr)	625,600	625,600	625,600
Total Carbon (% by weight)	26.20%	26.21%	25.49%
Biogenic Carbon (% of Total Carbon)	57.20%	58.85%	74.58%
Non-Biogenic Carbon (% of Total Carbon)	42.80%	41.65%	25.42%

Table 14C.2 Comparative sensitivity analysis of net annual emissions savings

Waste Composition	Electricity generation emissions factor			
	Current: Gas *380 gCO_2e/kWh*	***Current: Grid Average*** *182 gCO_2e/kWh*	***2035: Grid Average*** *23 gCO_2e/kWh*	***2050: Grid Average*** *6 gCO_2e/kWh*
	Energy export option: *Electricity only*			
Current Waste	139,275 (++)	**73,952**	21,496 (--)	15,887 (--)
Reduced Recyclables	151,217 (+++)	86,351 (+)	34,261 (--)	28,692 (--)
Reduced Food & Plastic	314,582 (+++)	255,113 (+++)	207,358 (+++)	202,253 (+++)
	Energy export option: *Electricity & Steam*			
Current Waste	158,748 (+++)	103,246 (+)	58,675 (-)	16,722 (--)
Reduced Recyclables	170,689 (+++)	115,644 (++)	71,441 (-)	29,527 (--)
Reduced Food & Plastic	334,055 (+++)	284,407 (+++)	244,538 (+++)	203,088 (+++)

Table values report difference between net annual savings in GHG emissions in tCO_2e for the proposed EfW CHP Facility compared to Landfill. The highlighted cell in Table 14C.2 indicates the savings in net annual GHG emissions in tCO_2e for the Core Case presented in the main GHG assessment. The relative change compared to the Core Case for each scenario is indicated in brackets:
Change >0-49% = +/-
Change >50-99% = ++/--
Change >100% = +++/---

1.2.3 The sensitivity analysis indicates that for the current waste composition profile (**Table 14C.1 Residual waste composition – current and future scenarios**), the EfW CHP Facility would deliver a reduction in annual carbon emissions when compared to landfill in all cases, including for future scenarios that account for increased decarbonisation of UK Grid electricity supplies. As may be expected, when considering the forecasts for lower emissions factors associated with increased decarbonisation of UK grid electricity generation in 2035 and 2050, the benefits of avoided emissions for both the EfW CHP Facility and landfill would be less, with a subsequent reduction in the scale of net emissions savings for the EfW CHP Facility. For the Core Case used in the main GHG assessment (highlighted cell in **Table 14C.2 Comparative sensitivity analysis of net annual emissions savings**), the benefits are reduced by approximately 75% in the 2035 grid average supply scenario and 79% in the 2050 scenario (net savings compared to landfill: 21,496tCO_2e and 15,887tCO_2e respectively).

1.2.4 For the 'Reduced Recyclables' future waste profile the main difference in the composition of the residual waste (**Table 14C.1 Residual waste composition – current and future scenarios**), is a marginal increase in the proportion of biogenic carbon compared to the Core Case (58.85% versus 57.20%), and a marginal reduction in the NCV of the waste (9.50MJ/kg versus 9.53MJ/kg). The comparative emissions for the Reduced Recyclables waste profile shows a similar pattern to the sensitivity analysis for the current waste composition profile, i.e., a net saving in

annual carbon emissions for the EfW CHP Facility compared to landfill in all cases, with a reduction in the scale of savings when considering future decarbonisation of grid electricity generation in 2035 and 2050. It is noted that in all cases the emissions savings for the EfW CHP Facility are marginally better under the Reduced Recyclables scenario than for the Current Waste scenario. Compared to the Core Case highlighted in **Table 14C.2 Comparative sensitivity analysis of net annual emissions savings** (net savings: 73,952tCO_2e), the equivalent scenario for the Reduced Recyclables waste profile delivers net savings compared to landfill of 86,351tCO_2e, an increase of 17% on the net emissions savings.

1.2.5 The 'Reduced Food & Plastic' future waste profile (**Table 14C.1 Residual waste composition – current and future scenarios**), assumes a 'best-case' scenario for residual waste, where the majority of food and plastic material is prevented from passing into residual waste, although recognising that it may not be possible to completely remove these materials from the waste arisings. Although the overall carbon content of the waste is only reduced by 1% under this scenario, there is a significant reduction in non-biogenic carbon compared to the current waste profile (25.42% versus 57.20%), and there is also a decrease in the NCV (8.85MJ/kg versus 9.53MJ/kg). This change is primarily attributable to the reduction in plastic material, which is a source of fossil-based, rather than organic carbon, and tends to have a higher calorific value than other material found in residual waste streams. The sensitivity analysis indicates that for the Reduced Food & Plastic waste profile the EfW CHP Facility would deliver a significant improvement in net savings in annual carbon emissions compared to the Current Waste scenario in all cases. The primary reason for this is that in the case of an EfW combustion process, biogenic carbon is considered to be neutral and only carbon dioxide emissions from fossil sources needs to be considered; however, for landfills, fossil carbon is considered to be neutral (i.e., from the degradation of plastics) and it is the biogenic carbon converted into methane (LFG) that contributes to GHG emissions. Therefore, the relative change in biogenic and non-biogenic carbon content in the Reduced Food & Plastic waste profile contributes to the EfW CHP Facility releasing less emissions and landfill producing additional emissions.

1.2.6 When considering the scenario where steam is also exported by the EfW CHP Facility, the sensitivity analysis indicates that the emissions savings would be enhanced in each case.

Sensitivity analysis summary

1.2.7 It is difficult to predict with certainty how each of the variables being considered could change now and in the future, so the analysis provided here is intended to provide an indication of the broad direction and scale of the impact on emissions savings attributable to the EfW CHP Facility compared to landfill. The key findings of the sensitivity analysis are summarised as follows:

- A change in the future composition of residual waste (assuming a reduction in recyclable materials to a greater or lesser extent), would appear to enhance the net savings in emissions attributable to the EfW CHP Facility.
- Further decarbonisation of UK Grid electricity generation towards 2050 would reduce the scale of savings derived from avoided emissions for the EfW CHP

Facility, although this would have a similar effect on electricity generated from LFG, so the EfW CHP Facility still delivers a net reduction in emissions.

- Exporting steam from the EfW CHP Facility in addition to electricity, would enhance the net savings in emissions attributable to the EfW CHP Facility. Opportunities to export steam in combination with electricity form part of the Proposed Development for which consent is sought and would be subject to further discussion by the Applicant with potential customers to ensure the delivery and most effective application of this capability.